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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/177,729	10/23/1998	DAVID S. TAUBMAN	10960578-1	3513

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EXAMINER

HARRIS, TIA M

ART UNIT	PAPER NUMBER
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2615

15

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/177,729

**Applicant(s)**

TAUBMAN, DAVID S.

**Examiner**

Tia M Harris

**Art Unit**

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-6 and 8-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-6 and 8-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All \* b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 3-6 and 8-26 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8-9, 5-6, and 12-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wober (5475769).

**(Claim 8)** Wober discloses a method of processing an input digital image produced by an optical system, the input image having less than full color information at each of a plurality of pixels (e.g. col 4, lines 11-15), the method comprising accessing an operator including an array of demosaicing weights (col 5, lines 1-11), values of the weights determined by at least one property of the optical system (col 7, lines 14-21), and applying the operator to the input image to produce an output image having full color information at each of a plurality of pixels (col 6, lines 7-18). The optical properties are an amount of lens blurring that is involved in determining the ultimate value of the weights.

**(Claim 9)** Wober further discloses the operator compensates for degradation in the optical system, wherein when image degradation would occur due to inaccurate coefficients derived from conditions that produce residual errors, the parameters are adjusted to reduce the error (col 7, lines 1-22).

**(Claim 5)** Wober further discloses the operator depends on a source of illumination used to generate the image (col 5, lines 50-53; the illumination is used to form the red, green and blue images).

**(Claim 6)** Wober further discloses the operator depends on the type of scene captured in the image (col 7, lines 50-53; red scene, green scene, blue scene).

**(Claim 12)** Wober further discloses the operator is also based on a set of known images, where the known images are the red, green and blue test images (col 7, lines 50-53).

**(Claim 13)** Wober further discloses different operators are used for different images (col 5, lines 59-65).

**(Claims 14-16)** See the rejection of claim 8 above. Wober further discloses a processor for performing the above-specified method, an article for a processor, the article including computer memory encoded with instructions for causing the processor to perform the method, and a digital camera (163) including a processor programmed to perform the method (see figs 5-7).

**(Claim 17)** Wober further discloses the digital camera (163) further comprises memory for storing a plurality of candidate operators; and wherein the processor is programmed to access the operator by selecting the operator from one of the plurality of candidates, the operators being the coefficients C1 – C33 (col 4, lines 20-28).

**(Claim 18)** Wober further discloses a method of generating a linear operator for demosaicing of a digital image by a digital camera, the method comprising using camera parameters to design coefficients for the linear operator, the camera parameters being the amount of lens blurring and amount of overlap between the spectral sensitivity ranges (col 6, lines 7-18; col 7, lines 14-21).

**(Claim 19)** Wober further discloses a standard noise model and a linear minimization technique are used to generate the coefficients from the camera parameters (col 6, lines 7-27).

**(Claim 20)** See the rejection of claims 14 and 18 above.

**(Claim 21)** Wober further discloses the value of the demosaicing weights are determined to additionally compensate for image degradation, wherein when image degradation would occur due to inaccurate coefficients derived from conditions that produce residual errors, the parameters are adjusted to reduce the error (col 7, lines 1-22).

**(Claim 22)** See the rejection of claim 17 above.

**(Claim 23)** Wober further discloses the operators are included in T-matrices (transformation matrices) since the data is being transformed from pixels with missing color information to pixels with full color information (col 4, lines 11-30; col 5, lines 1-11, 23-34; col 8, lines 23-26).

**(Claim 24)** Wober further discloses the at least one property contributes to image degradation in that if the image is not right there are residual errors in the image (col 7, lines 14-21).

**(Claim 25)** Wober further discloses the at least one property is variable from system to system (in that it depends on the camera being used) (col 7, lines 14-21).

**(Claim 26)** Wober further discloses the camera parameters are used so that the coefficients are designed to perform both demosaicing and compensation of image degradation by the digital camera, wherein when image degradation would occur due to inaccurate coefficients derived from conditions that produce residual errors, the parameters are adjusted to reduce the error (col 7, lines 1-22).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wober in view of Bell (5170202).

Wober discloses a method of processing an input digital image produced by an optical system as discussed above, and further discloses the optical system includes a lens system wherein blur is a property of the lens system used to determine the weights of the operator (col 7, lines 14-21). Wober does not specifically disclose the optical system also includes a lens system, and wherein the at least one property is focal length or f-number of the lens system.

Bell discloses a contrast-based autofocus mechanism, and teaches that for each set of contrast measurements, differences in contrast between successive measurements (either due to change in aperture setting (f-number) or focal length) yield a blur circle difference value (col 2, lines 14-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made that the focal length and f-number values disclosed by Bell would result in the blurring disclosed by Wober, in the manner taught by Bell, and therefore the focal length and f-number are clearly optical properties in Wober that determine the weights of the operator.

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wober in view of Acharya (US 6348929 B1).

**(Claim 10)** Wober discloses a method of processing an input digital image produced by an optical system as discussed above, but does not specifically disclose the step of applying the

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operator includes forming a plurality of input vectors from the input image, each input vector formed from super pixels, and applying the operator to the input vectors.

Acharya discloses a scaling algorithm and architecture for scaling an image wherein each input vector is formed from super pixels (Col 4, Lines 62-67; Col 5, Lines 1-3; Col 6, Lines 49-60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made that each input vector disclosed by Wober is formed from super pixels, in the manner taught by Acharya, since it is well known in the art to use super pixels to provide an output of varying resolution.

**(Claim 11)** Acharya further discloses the operator is used for different resolutions, and a resulting fixed resolution image is resampled (Col 6, Lines 56-67; Col 7, Lines 1-13).

#### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tia M Harris whose telephone number is 703-305-4807. The examiner can normally be reached on M-F 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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